

# Oil Review

Oil · Gas · Petrochemicals

## Africa

VOLUME 12 | ISSUE 2 2017

SEE US AT THE SHOWS



## Nigerian oil and gas: Challenges and opportunities

Event previews: OTC, Ghana Summit, IP Week and Africa Independents Forum

Angola and Namibia: News from an established market and an emerging player

Logistics, data management, seismic technology, metering, intelligent oilfields and fabrication



**Mohammad Sanusi Barkindo,**  
Secretary General, OPEC (p18)



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The future of the Nigerian oil and gas industry is under the spotlight. (Clara Sanchiz/Flickr)

## EDITOR'S NOTE

NIGERIA'S OIL AND GAS industry is at a crossroads. Operators are trying to keep costs down as the oil price remains under US\$60 a barrel but this provides opportunities for service providers who can offer cost-effective solutions that don't compromise on quality.

Additionally, speakers at this year's Nigeria Oil and Gas Conference and Exhibition were largely optimistic that 2017 would be the year the Petroleum Industry Bill finally becomes law. Turn to page 18 for our report on the future of the Nigerian industry, with plenty of honest insights from government and private sector stakeholders.

Elsewhere in this issue, we have updates from two very different African hydrocarbons markets. There are positive signs amid ongoing challenges in the long-established Angolan market (p22), while Namibia is emerging as a potential major player, attracting serious investment (p26).

We are indeed living in interesting times.

**Georgia Lewis**  
Managing Editor

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# Executives' Calendar 2017

## APRIL

**18-19** **19<sup>th</sup> International Conference on Oil, Gas & Petrochemical Engineering**  
Paris  
[www.waset.org](http://www.waset.org)

**24-25** **2<sup>nd</sup> Annual LNG International Summit**  
Barcelona  
[www.lngsummit.org](http://www.lngsummit.org)

**26-27** **StocExpo Middle East Africa**  
Dubai  
[www.easyfairs.com](http://www.easyfairs.com)

## MAY

**1-4** **Offshore Technology Conference**  
Houston  
<http://2017.otcnet.org>

**9-11** **Oil, Gas & Mines Africa Conference**  
Nairobi  
[www.eage.org](http://www.eage.org)

**24-25** **16<sup>th</sup> Africa Independents Forum**  
London  
[www.africa-independentsforum.com](http://www.africa-independentsforum.com)

**25** **18th Global Women Petroleum & Energy Club Luncheon**  
London  
[www.globalwomenclub.com](http://www.globalwomenclub.com)

## JUNE

**7-9** **Africa Energy Forum**  
Copenhagen  
[www.EnergyNet.co.uk](http://www.EnergyNet.co.uk)

**22-23** **The 8<sup>th</sup> Ghana Summit**  
Accra  
[www.cwcghana.com](http://www.cwcghana.com)

**25-27** **International Oil Reserves & Energy Production**  
Paris  
[www.waset.org](http://www.waset.org)

## JULY

**9-13** **World Petroleum Congress**  
Istanbul  
[www.22.wpc.com](http://www.22.wpc.com)

**31 Jul-2 Aug** **Nigeria International Conference and Exhibition**  
Lagos  
[connect.spe.org/spenc/naice/naice2017](http://connect.spe.org/spenc/naice/naice2017)

## AUGUST

**16-18** **3<sup>rd</sup> East Africa Oil & Gas Conference**  
Dar-es-Salaam  
[www.expogr.com](http://www.expogr.com)

## FEBRUARY-MARCH 2018

**26 Feb-1 Mar** **Nigeria Oil & Gas Conference & Exhibition**  
Abuja  
[www.cwcnog.com](http://www.cwcnog.com)

*Readers should verify dates and location with sponsoring organisations, as this information is sometimes subject to change.*

## Bulk liquid storage event for Middle East and Africa returns

LEADING REGIONAL OIL companies, tank terminal operators, traders, financiers and regulators will be speaking at Stocexpo Middle East Africa, when the event comes to Dubai on 26-27 April.

Large scale investment, even during the downturn, has led to growth. The UAE alone is expected to double its storage capacity in the next few years.

ENOC, Fujairah Oil Terminal, GPS Chemoil, Gulf Refining Co, Gulf Petrochem, Horizon Terminals, Siddco,

Socar Aurora, and Star Energy OilTanking will all be represented at the event.

The conference will be at the core of the event, with speakers addressing the trends, challenges and opportunities facing the tank storage industry. Conference topics will include growth and expansion opportunities across the region, financing, oil price movements and their impact on the storage market, improving safety, efficiency and resilience for operators, and Fujairah's

growing role as a trading hub.

As well as the networking opportunities on offer with more than 100 exhibitors at the event, there will be a variety of networking events over the two days. These will be a chance to share experiences with peers, build new professional relationships and strengthen existing ones.

The networking lounge located on the show floor, as well as an official exhibition networking reception on the first evening of the event.

Nick Powell, Stocexpo and Tank event director said, "One look at this year's programme shows how serious we are about delivering world-class content, finely tailored to global and local needs and the interests of terminal operators in the region. Delegates can expect a stellar mix of regional, international and highly technical content, delivered by world authorities."

*For more information:*  
[www.stocexpomiddleeastafrika.com](http://www.stocexpomiddleeastafrika.com)



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## Cameroon FLNG vessel slated to commence operations in September 2017

CAMEROON IS SET to bring the world's latest FLNG vessel into service with Golar's Hilli Episeyo slated to commence operations in late 2017.

This means Cameroon will most likely see its FLNG vessel come online before the much-publicised Australian project. It is expected that Shell's Prelude, located off the coast of Western Australia, will follow in 2018.

Hilli Episeyo, a converted LNG carrier, will operate from Cameroon's offshore Kribi field, providing storage, liquefaction and offloading services. This has been made possible via a tolling agreement between Cameroon's national oil and gas company, Société Nationale des Hydrocarbures and Perenco Cameroon as a joint venture.

It is expected that the facility



Image Credit: Samina Cooper/Flickr

*The coast off Cameroon will soon be home to an FLNG vessel.*

will produce gas reserves at a rate of 1.2mtpa over a period of around eight years.

To date, around 4,500 contractors have worked on the project. Testing and pre-commissioning is taking place and the vessel is scheduled for redelivery in May with a view to

start production by the end of September 2017. As well as being used to exploit gas in the Kribi field, the government has expressed an interest in opportunities for it to be used in neighbouring offshore fields, such as the Fortuna Field off the coast of Equatorial Guinea.

## Sasol group set to begin oil production in Mozambique within three years

SASOL GROUP SHOULD begin extracting oil in Mozambique within two or three years, following the discovery of hydrocarbons in two offshore wells off the coast of Inhambane province, said Sasol executive

director Stephen Cornell. Cornell told Reuters that the two sites would be the first oil wells to become operational in Mozambique.

The Sasol group already exploits natural gas deposits in

Pande and Temane, Inhambane province. The American group Anadarko Petroleum and Italy's ENI also discovered major gas deposits several years ago in the Rovuma Basin in northern Mozambique.

Cornell said Sasol had drilled four prospecting wells, with all producing positive results. Oil was also discovered in one of the areas where only natural gas was expected.

The group began drilling the first well in May 2016 under the production-sharing agreement signed with the Mozambican government in Inhambane.

At the time it was estimated that the first development phase of that agreement, which considers an eventual 14 wells, would cost US\$1.4bn.



Image Credit: Maureits Vermeulen/Flickr

*Offshore prospects for Mozambique look promising following Sasol's announcement.*

## Oranto's \$500mn oil exploration in South Sudan

DESPITE ONGOING CIVIL and political unrest, Oranto Petroleum plans to invest US\$500mn to develop South Sudan's Block B3, launching an exploration campaign. The Ministry of Petroleum and Oranto Petroleum Company, South Sudan signed the exploration and production sharing agreement (EPSA).

The B3 area covers 25,150km<sup>2</sup>. Some aeromagnetic and seismic data have been acquired for the area but no wells have been drilled. The block features productive parts of the Muglad Basin to the northwest and estimated reserves of more than 3bn barrels of oil. It is categorised as low risk, high reward. Under the EPSA, Oranto will be the technical operator and 90 per cent shareholder of the block, with Nilepet holding a 10 per cent stake.

"We believe the petroleum resources of Block B3 are vast. To reach our target of more than double current oil production, we need committed new entrants like Oranto," said petroleum minister Ezekiel Lol Gatkuoth. "The government is working hard to reinvigorate the petroleum industry in South Sudan by creating an enabling environment for international oil and gas companies to invest and operate. It is up to the oil companies to come in, explore and produce."

"This is the beginning of a long-term collaboration with Nilepet, the people of South Sudan and our partners to bring to light the immense potential of Block B3," said Prince Arthur Eze, founder and chairman of Oranto Petroleum.





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## NNPC group managing director urges Nigerian Assembly to pass the Petroleum Industry Bill for stability

DR MAIKANTI BARU, group managing director for the Nigerian National Petroleum Corporation, has urged the country's National Assembly to quickly pass the Petroleum Industry Bill (PIB) into law.

The PIB was introduced in 2008 in a bid to improve petroleum industry efficiency and increase transparency and since then, it has undergone multiple amendments.

Speaking on a Nigerian talk show, Dr Baru said the long delay in passing the bill has led to fiscal uncertainty.

He said that if the PIB is passed into law, it will help dispel industry uncertainty, create an enabling environment for the industry to flourish and dissuade

IOCs from leaving the country.

Additionally, moves by the National Assembly to amend the Nigeria LNG (NLNG) Act have been criticised by Dr Baru as being a dampener to investor optimism in the industry.

"The Review of the NLNG Act by the National Assembly is causing a challenge for the Federal Government and the IOCs and it is sending wrong signals to the international community about how business is done in the country," Dr Baru told *Good Morning Nigeria*.

Dr Baru told viewers that the Nigerian LNG market is growing "at a tremendous rate", saying that between now and 2030, the market was projected to grow by 65 per cent.

*Bonny Island will be the site of NLNG Train 7.*



Image Credit: Chike Roland Okekegwijar/Flickr

Nigeria has multiple LNG projects under development, including the Bonny NLNG Train 7 and the Brass LNG project. The Brass project was delayed by ConocoPhillips exiting the project in 2014, but Dr Baru said that the NNPC would commit to its completion.

"We are refocusing on Brass

LNG and rebuilding the confidence of the IOCs in the project," he said. "It has a lot to do for Nigerians as it will create employment opportunities and create more revenue opportunities for the Federal Government. We will continue to put the right enablers in place for the project to go on."

## Nile Delta declared a "world-class basin" as BP discovers third gas play in the North Damietta Concession

"THIS LATEST DISCOVERY confirms our belief that the Nile Delta is a world-class basin," Bob Dudley, BP group chief executive, said when the company announced its third discovery in the North Damietta Concession.

Located in the eastern part of

the Nile Delta, the Qattameya Shallow-1 exploration well was drilled to a total depth of 1,961m in water depth of approximately 108m using the El Qaher II jack-up rig. The wireline logs, pressure data and fluid samples confirmed the presence of 37

metres of net gas pay in high quality Pliocene sandstones. BP is now studying options to tie the discovery back to nearby infrastructure.

BP has 100 per cent equity in the discovery.

"Qattameya marks our third

discovery in the block where we are already developing the Atoll field and appraising the Salamat discovery," said Dudley.

"We are delighted to sustain our success in these shallow Pliocene targets," said Hesham Mekawi, BP North Africa regional president. "We believe development of Qattameya could help unlock the resources in other nearby discoveries with similar shallow low pressure characteristics. This is part of our long-standing commitment to Egypt and to unlocking Egypt's energy potential." This latest discovery is located 60km north of Damietta city, 30 km south-west of Salamat and 35km to the west of Ha'py offshore facilities.

As well as its three East Nile Delta projects, BP is the operator of the West Nile Delta Project with an 82.75 per cent stake.

*The Damietta gas discovery is BP's latest offshore find in Egypt.*





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## South Sudan and Equatorial Guinea to collaborate on oil and gas upstream, downstream and infrastructure projects

A NEW AGREEMENT has been signed between South Sudan and Equatorial Guinea to exchange information on policy and regulation, promote upstream, downstream and infrastructure projects; and collaborate between the national oil companies Nilepet and GEPetrol.

South Sudan's government is attempting to develop its hydrocarbon sector despite ongoing civil and political unrest (see also, News, page 6, "Oranto's \$500mn exploration").

The Memorandum of Cooperation was signed by Equatorial Guinea's Minister of Mines and Hydrocarbons Gabriel Mbaga Obiang Lima and South Sudan's Minister of Petroleum H.E. Ezekiel Lol Gatkuoth.

"Partnership is what fuels the oil industry" said Gatkuoth. "South Sudan is proud to share its experiences with Equatorial



Image Credit: Shutterstock

*South Sudan and Equatorial Guinea are set to join forces on hydrocarbons projects.*

Guinea, and to learn from the great work of our fellow African producer. The petroleum industry is crucial to our nation's development. This agreement signals our dedication to investing in the sector as a driver for South Sudan's growth."

"The sharing of resources and knowledge between African oil and gas countries is critical," said Lima.

"Going forward, Equatorial Guinea will work closely with South Sudan for the benefit of our people and our national

economies. The lines of communication are open and we look forward to a deep and lasting collaboration."

Extending its expertise in oil and gas licensing rounds; gas monetisation and eliminating flaring; investing in power plants using flared gas; local content and offering to provide training to South Sudanese personnel, Equatorial Guinea's Ministry of Mines and Hydrocarbons will use its experience and resources to assist South Sudan's Ministry of Petroleum in revitalising the country's oil and gas industry.

Both countries bring decades of oil production experience to the table, and South Sudan is now working to more than double oil output to 290,000 barrels per day. Equatorial Guinea is nearing the close of its EG Ronda 2016 licensing round.

## Leaders in offshore oil technology to converge on Houston for annual conference and exhibition

SINCE 1969, LEADERS in the offshore oil technology sector have met each year in Houston, Texas, for the Offshore Technology Conference (OTC).

This year, the technical programme will cover a wide range of developments and issues pertinent to operators in today's challenging economic climate.

The low oil price will, not unexpectedly, make its presence felt across the technical programme with updates on world-class projects which feature game-changing, lower cost methods. Strategies for adapting to the ongoing low price scenario will be part of the discussions. New developments in

major offshore basins in Mexico and Brazil concerning regulation

and development will also be on the agenda.



Image Credit: Flickr/BSSE

*Delegates from the Bureau of Safety & Environmental Enforcement at OTC 2016.*

Safety and risk management will again be a crucial feature of the technical programme with the emphasis on safety and responsibility as the cornerstones of success, even when cost savings need to be made.

Looking ahead, this year's OTC will cover the digital revolution, especially the role of big data and cybersecurity in offshore operations.

In readiness for a world where fossil fuels will eventually be depleted, there will be sessions on designing and developing offshore renewable energy structures and infrastructure.

For more information:  
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## OPEC Secretary General pays first working visit to Nigeria

SECRETARY GENERAL OF OPEC, Mohammad Sanusi Barkindo, has paid his first working visit to Nigeria since he assumed the role in August 2016.

Barkindo, the fifth Nigerian to be appointed to OPEC's top job, met with Professor Yemi Osinbajo, the Acting President of the Federal Republic of Nigeria in Abuja, Emmanuel Ibe Kachikwu, Nigeria's Minister of State for Petroleum Resources, as well as senior government and corporate leaders.

The Secretary General expressed gratitude for Nigeria's support during the consultations between OPEC and non-OPEC nations that led to the Algiers Accord, the Vienna Agreement and the Declaration of Cooperation with 11 non-OPEC nations.

Barkindo also briefed the Acting President on the implementation of the decisions, as well as oil market developments and prospects.

He gave a speech at an event hosted by Emmanuel Ibe Kachikwu, Nigeria's Minister



*Mohammad Sanusi Barkindo,  
Secretary General of OPEC.*

of State for Petroleum Resources, with guests including the Nigerian-based ambassadors of

the other 23 countries that were party to last year's OPEC decisions and the non-OPEC Declaration of Cooperation.

"[The] vision, leadership and courage" of all heads of states and governments, oil ministers and envoys to the complex decision-making process meant that "we have turned a historic page in the global oil industry," he told the event.

He added that "for the first time in the history of the industry, 13 OPEC nations and 11 non-OPEC participating countries, came together to help rescue and stabilise this strategic global industry – one that has been vital to the development of modern civilisation."

As part of his visit, which took place in late February and early March, Barkindo travelled to Yola, his hometown, where he was received by the governor of Adamawa State.

He also addressed the Nigerian Oil and Gas conference, which was held in Abuja. Turn to page 18 for the full report from the event.

Image Credit: OPEC



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# DRIVING THE INDUSTRY FORWARD AT THE 8TH GHANA SUMMIT

Organisers of the 2017 Ghana Summit have high hopes for an optimistic event after Emmanuel Armah-Kofi Buah, Ghana's petroleum minister, said that bold steps have been made to drive the country's oil and gas industry forward.

**W**HEN HE OPENED the 2016 Ghana Summit, Emmanuel Armah-Kofi Buah said bold steps have been taken to drive the oil and gas industry forward, helping Ghana on the road to prosperity.

Buah described the summit as "an important milestone in the country's march towards the acquisition of critical skills,

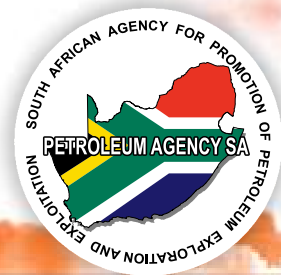
**“ The minister urged all stakeholders to “collaborate effectively” after Ghana’s energy crisis and to move forward for economic growth**

knowledge and competencies that would enable Ghana to benefit from the oil and gas industry that is about taking roots in our economy.”

The Ghana Summit will offer delegates multiple networking opportunities with leading players from industry and government. ♦

For more information about the 2017 Ghana Summit: [www.cwcghana.com](http://www.cwcghana.com)

## Petroleum Agency SA Explore South Africa!



**Petroleum Agency SA** encourages investment in the oil and gas sector by assessing South Africa's oil and gas resources, and presenting these opportunities for exploration to oil and gas exploration and production companies.

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Preparation of Environmental Management Plans requires public consultation and a clear demonstration that valid concerns will be addressed.

**Petroleum Agency SA,** based in Bellville, Cape Town, is responsible for the promotion and regulation of exploration and exploitation of oil and gas (petroleum) resources.

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# MIXED OUTLOOK FOR NIGERIAN OIL AND GAS

## AT IP WEEK

Speakers at the annual London event offered a mixed prognosis for the future of the Nigerian oil and gas industry, with calls for further reform to make the country more attractive to international investors.

**T**HE OUTLOOK FOR Nigeria, Africa's biggest oil producer, is mixed, according to speakers at IP Week, held in London in February. Ade Adeola, managing director, energy and chemicals, Africa and Middle East, for Standard Chartered Bank, led calls for further fiscal reform under Muhammadu Buhari's government in his opening address to the conference.

In a presentation focused on ensuring improved access to energy across Africa, Tayo Ariyo, new business development manager, Sub-Saharan Africa, for Shell, shared the positive case study of Nigeria's Afam Power Plant, a domestic gas-to-power operation that supplies 18 per cent of Nigeria's grid electricity. Additionally, Ariyo said that Forcados Yokri and Southern Swamp integrated gas-to-power projects are under construction. Projects such as these will reduce reliance on biomass fuels, which are inefficient, unreliable in supply, and dangerous.

Ogan Kose, managing director with Accenture's strategy consulting practice and Trading, Valuation and Optimisation group, addressed the conference on making Africa, and Nigeria in particular, more attractive to investors. He said that if progress is made on a large number of projects across multiple African countries, this will impact on

Nigeria as well as Angola. Currently, these two countries produce around 80 per cent of the continent's fossil fuels but this will decrease as the African oil and gas market becomes more fragmented.

Pade Durotoye, CEO, Oando Energy Resources, started his presentation with the bad news about the Nigerian economy. This included the devaluation of the naira, GDP growth falling by 1.55 per cent, inflation up at 18.4 per cent, and unemployment running at 32.6 per cent.

Durotoye then went on to outline the challenges in all sectors of the Nigerian oil and gas industry.

For upstream, he said the "crash in oil prices", bunkering and pipeline vandalism, joint venture funding challenges, and an unstable fiscal environment were serious issues. However, he added that pipeline vandalism is not as big a problem as it used to be in recent years.

Gas pricing, inadequate gas logistics infrastructure and the need for more gas-to-power solutions were cited by Durotoye as challenges for the midstream sector.

For downstream, he said subsidies, "sub-optimal refineries", "a dearth of infrastructure" and forex challenges were the major obstacles.

Maintenance is another issue that needs to be addressed,



Image Credit: Boris15/Shutterstock.com

according to Durotoye: "We are using assets for twice as long as we should ... infrastructure is not being used to its full capacity ... [and the NNPC is] reluctant to look at the whole economy," he said.

Durotoye's address reflected the view at IP Week that 2017 should be used as a time to resolve issues, push legislative reform and encourage the NNPC to decouple from the industry. He urged a passing of the PIB as a priority for 2017.

"Nigeria is the land of promise that keeps promising," observed Durotoye. "We need to get gas pricing right – until then, we will struggle to capitalise."

Upstream, Durotoye recommends decoupling petroleum products from government intervention, saying this "needs political will" and that the days of "paternalistic government are over".

On a more optimistic note, he said the "reason why we get up and go to work is because we believe that in our lifetimes, we can fix it". Rather than waiting for all the issues to be resolved, Durotoye said it is important to invest now, while projects such as deregulating refineries and liberating the forex market are still works in progress.

He said Nigeria is "on the right path [so] let's start talking it up now". ♦





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An oil rig and tanker at Port Harcourt.  
The industry is hoping for increased  
activity once the PIB has passed.

# WILL THE NIGERIAN OIL AND GAS INDUSTRY BE TRANSFORMED IN 2017?

Image Credit: Shutterstock

The Nigeria Oil & Gas conference provided a platform for optimism within the industry, with high hopes for the passage of the Petroleum Industry Bill among the speakers. *Oil Review Africa* editor, Georgia Lewis reports on what could be a pivotal event for Nigeria.

**FURTHER DEREGULATION OF** the Nigerian oil and gas industry; increased private sector involvement; and whether this year would finally see the Petroleum Industry Bill (PIB) pass were the hot topics at the 2017 Nigeria Oil and Gas (NOG) conference, which was held in Abuja from 26 February to 1 March.

In his opening address on the first day of the conference, Dr Emmanuel Ibe Kachikwu, Nigeria's petroleum minister reflected on the challenges of the past two years and urged "drastic change" for the months and years ahead in the country's hydrocarbons industry.

He said that when the oil price was around US\$120/barrel, "the world was a beautiful place to be" in terms of project development and access to

finance. However, he described the events surrounding the latest downturn as "a lesson in history for all of us".

Dr Kachikwu said that while technology has made operations easier, problems such as poorly maintained or underdeveloped infrastructure, namely decades-old pipelines and neglected

**“ When oil was around US\$120/barrel, the world was a beautiful place but the downturn is a lesson in history for all of us”**

refineries, as well as a glut caused by overproduction have contributed to the current crisis.

"We never saved as a nation ... there was no investment in infrastructure ... there was massive expenditure and massive subsidies ... and a lot of fraud ... Nigeria was just not prepared for the decline," he told the conference. In his address, he also committed the Nigerian government to better meeting cash calls, which has long been a source of tension in the industry.

He was optimistic on the subject of preventing future attacks on Nigerian oil infrastructure by militants.

On the issue of attacks on oil facilities by militants, he said Nigeria should aim for zero shutdowns.

"I'm sure it sounds crazy but I believe it's possible," he said.

## More private sector involvement?

Dr Kachikwu's address provided indications that the government is interested in increasing the involvement of the private sector in the country's oil and gas industry.

Regarding infrastructure development, Dr Kachikwu said that "the government is not in a position to fund infrastructure [and there is a need to] bring private investment [which is] essential for the industry to work effectively."

To this end, Dr Kachikwu urged improved relationship-building between the public and private sectors, as well as "releasing assets to the private sector."

Refineries and depots, as well as pipelines, are all required as part of the infrastructure development, he added.



"We need to move away from the old model," Dr Kachikwu said. For the Nigerian hydrocarbons industry to have a strong business case, he told NOG delegates that the cost of production must fall.

He concluded his address by outlining his "wish list" for reform in the Nigerian oil and gas industry. These included working more closely with state governments, ensuring all projects benefit citizens, particularly as a means of preventing militancy, and dealing with militants by "working faster than the speed of their anger".

Ensuring the Nigerian National Petroleum Corporation (NNPC) is competitive is another element of Dr Kachikwu's vision, as well as policies to "aggressively develop" gas, especially gas-to-power projects.

### The long process of passing the PIB

The PIB was first introduced to the Nigerian Assembly in 2008. It proposes far-reaching reforms to the country's hydrocarbons industry, with the original version providing for the unbundling and commercialisation of the NNPC, transforming existing joint ventures between the NNPC and multinational oil companies, deregulating the downstream sector, creating new regulatory bodies, and introducing a new fiscal regime.

Since 2008, there have been multiple amendments to the bill, in particular in regard to the new fiscal regime which was designed to increase Nigerian government take. New objectives have been added to the bill, such as clauses to encourage the development of local content, improved transparency, and establishing a profit-driven industry.

Anibor Kragha, chief operating officer, refineries, NNPC, said the PIB would get through in 2017 "ensuring the right law at the right time to



Image Credit: Shutterstock

*With an oil platform featuring on the newest Nigerian currency, there is optimism about the industry's role in the economy.*

ensure operators work in a disciplined market."

Kragha said that NNPC has "almost put together a road map for a deregulated market". He added that with past moves towards downstream deregulation "we jumped the gun and then had to correct mistakes".

"We'll get there, it's a journey ... the PIB will pass," he said.

Kragha said this should achieve greater efficiencies in the downstream sector.

"I think this will happen very quickly," he told delegates.

This was reflected in the address by Ewariez Useh, managing director of Aiteo Downstream, at the special session on the downstream sector.

Useh said he is confident the Petroleum Industry Bill (PIB) will go through this year.

"When the market is deregulated, when there is a free market, an open market, we will be more efficient," he said.

### Deregulation for the downstream sector?

A gradual process of downstream sector deregulation and increased private sector involvement was discussed at a special session.

In his introductory address as moderator, Alexander Ogedegbe, former managing director, Port Harcourt and Kaduna refineries, NNPC, offered the historic context for the current situation with the Nigerian downstream sector. After Nigeria started shipping crude oil in commercial quantities in 1960, he cited an early BP-Shell joint venture refinery which "worked for many years", expanding from a capacity of 30,000 bpd to 60,000 bpd. However, by 1978, all the refineries were operated by the government, a situation which is unique to Nigeria.

"This is one of our problems ... one of many reasons for where we are today," Ogedegbe said.

**“When the market is deregulated, when there is a free market, an open market, we will be more efficient”**

He urged a "flexible ownership structure" for maintenance, expansion, and production along the value chain so the private sector can help meet the energy and fuel demands of the public.

The session heard from speakers representing the private sector as well as the NNPC. Useh, of Aiteo Downstream, asked the panel what incentives exist for private investment when refineries generally run at around 20 per cent capacity.

He said to "create a proper environment" for investment, the government needs to "go back to basics [with] proper regulation".

Olaposi Williams, acting CEO, OVH Energy (licensee of Oando's retail brand), said it is essential for the downstream sector that refineries are working at full capacity.

"It is a very simple structure - we get the product, we store it, we distribute it," she said of OVH Energy's operations.

Williams expressed frustration at Nigeria's reliance on imports when LPG refineries are not working at full capacity and there are dry, retail forecourts and empty depots.

"It is displeasing that with so much crude capacity, we take it out of the country to refine it and then bring it back to be consumed - what efficiency is that?" she asked. However, she welcomed the assurances from the NNPC speakers that by 2020, Nigeria would no longer be dependent on imports.

Henry Ikem Obih, chief operating officer, downstream, NNPC, painted a rosier picture of Nigerian downstream operations, saying all four refineries were running for all of January 2017 and that LPG is being produced every day.

Obih said a three-step "preparation-financing-execution" strategy is in place to create a positive environment for private sector investment, with NNPC having a "focus on the bottom line".

Summing up the downstream session, Ogedegbe said: "We want an efficient system that pays for itself."

### Downstream dilemmas for the LPG sector

Dayo Adeshima, president of the Nigeria LPG Association, said the country's LPG story "has been a very sad one" with supplies diminishing in 2006 and 2007. However, he added that he is hopeful that gas will play a bigger role in the Nigerian energy mix, particularly for cooking and autogas.

"NNPC is looking at doing something with refineries and I

**“ NNPC is looking at doing something with refineries and I hope LPG is a big part of that as it's a game-changer for the country”**



Image Credit: Shutterstock

*Oil spills, such as this one at Goi Creek, cost the Nigerian economy dearly.*

hope LPG is a big part of that as it is a game-changer for the country," Adeshima said.

He cited the example of Ghana as a market that has moved ahead with LPG as an automotive fuel, as well as a growing LPG-to-power sector.

"It's versatile, it's clean, it saves the country a lot of money," Adeshima said of LPG.

### OPEC Secretary-General addresses NOG

Dr Mohammad Sanusi Barkindo, secretary-general of OPEC, addressed the conference on the subject of the global oil market, as well as the need for greater deregulation in Nigeria.

Since taking on the OPEC position, Dr Barkindo is particularly proud of the cooperation achieved between OPEC and non-OPEC members in the final quarter of 2016 when it was agreed that oil production should be cut. With the oil price remaining steady at around the US\$50/barrel mark, Dr Barkindo said that "extreme volatility has abated".

"Twenty-four countries have made a shared commitment to work together to reinforce the decision," he told NOG delegates.

With energy demand expected to rise by 40 per cent by 2040 in line with an increase in global population heavily centred on Africa and the Middle East, Dr Barkindo said that oil and gas will continue to play a major role in meeting that demand. He added that this will take place against a backdrop of uncertainties, including the cost of production, technology, geology and geopolitical developments.

New refining capacity was deemed essential by Dr Barkindo, with the Asia-Pacific region leading the way. He echoed the sentiments of Dr Kachikwu's address when he said it is important for Nigeria to boost refining capacity.

Dr Barkindo said that OPEC has been championing deregulation in Nigeria's downstream sector to help the country meet refining goals.

Dr Barkindo concluded his address by stressing the important role the oil industry has to play in mitigating climate change. His comments come in the wake of the historic 2015 Paris Agreement on climate change, with all 11 OPEC nations signing up. He said that by

developing the oil industry sustainably for producers and consumers, "people will be lifted out of poverty".

### ExxonMobil and Marine Platforms win NOG awards

At a gala dinner at the end of the conference, ExxonMobil took out the Excellence in the Nigerian Oil and Gas Industry award, in honour of the company's significant discoveries and development activities, and its contribution to the Nigerian economy.

In particular, the company has made an important deepwater discovery with the Owowo field potentially holding 1bn barrels of oil.

The Nigerian Content Implementation award went to Marine Platforms for its ability to create local jobs while controlling production costs, good corporate governance under the leadership of managing director, Taofik Adegbite. It was a recognition of excellence in training local people, and becoming a company that other players, such as the NNPC, turn to for training and expertise. ♦





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# ANGOLA SUSTAINS OFFSHORE INVESTMENT

Africa's second-biggest crude producer is squaring up to a challenging oil price environment, as investors remain undeterred in the country's prolific offshore sector. Martin Clark reports.

*Angola's offshore sector is continuing to perform well despite multiple challenges facing the country and the oil industry overall.*



Image Credit: Shutterstock

**A**NGOLA'S MIGHTY OFFSHORE industry is performing well, despite the impact of weaker crude oil prices which took the gloss off economic growth rates in recent years.

There are signs of a reverse, with Angola reporting US\$950mn in crude oil export revenues for January – the highest in 16 months. According to the finance ministry, the country exported 52.25mn barrels during January,

a small increase on December, as a result of improved demand overseas. And Angola's oil exports for May are set to be on a par with the previous month at around 1.67mn barrels per day (bpd), according to early loading

schedules.

Yet there's no doubt that the oil price slide has hit Angola hard, like most other producer states. The economy contracted by 4.3 per cent in the third quarter of 2016 after shrinking

by 7.8 per cent in the second quarter, figures from the National Institute of Statistics (INE) show, citing an "adverse international environment" and "significant drop" in the oil price.

## The foundations of the Angolan economy

The natural resources sector – its oil and gas and other minerals – underpin the nation's economy. State-run Sonangol accounts for 90 per cent of Angola's foreign earnings.

**“ This year, production has been below OPEC targets although new fields are coming into production or ramping up”**



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At the same time, Angola must also juggle its OPEC commitments, with Sonangol reportedly taking two cargoes out of its planned May exports in a move to comply with new production curbs. Angola has agreed to cut 78,000 bpd from a reference production level of 1.751 million bpd to comply with OPEC targets.

### Overcoming a drop in production and exports

So far this year, production and exports have been below that level, although new fields are coming into production or ramping up, which could further fuel momentum in the upstream sector. Among them are Chevron's Mafumeira Sul and Eni's West Hub and East Hub projects. The Chevron operated Mafumeira Sul field began oil production in October 2016 and will start supplying gas for export in the second quarter of this year, according to Sonangol sources.

The Mafumeira Sul project, in which Total and Eni also hold minority stakes, has the capacity to produce up to 150,000 barrels of oil and 350mn cubic metres of natural gas per day. Ramp-up to full production is expected to continue throughout 2018. Early production started on this project in October 2016 via a temporary production system.

Additionally, Total's Kaombo Block 32 development is slated to go into production this year. It is an ultra-deepwater oil project with investments worth around US\$15bn. Production is expected to be at 230,000 bpd.

Earlier this year, following a meeting between Total and Sonangol on the fringes of Cerawee in Houston, Total CEO Patrick Pouyanné expressed confidence in the Angolan market.

### Eni's plans for expansion in Angola

Eni announced in February that it had also started production of



*Claudio Descalzi, chief executive of Eni, is promising further development in Angola with solid production prospects for 2018.*

Image Credit: Eni/Flickr

its deep offshore East Hub development project in Block 15/06, some five months ahead of schedule. The Armada Olombendo floating production storage and offloading (FPSO) vessel can generate up to 80,000 barrels of oil and compress up to 3.4mn cubic metres of gas per day, bringing into play the Cabaça South East field. The project site, 350 km northwest of Luanda and 130 km west of Soyo, includes nine wells and four manifolds at a water depth of 450 metres.

The East Hub project will add to production from the existing West Hub project in the Sangos, Cinguvu and Mpungi fields, where another FPSO vessel is operating. End said total production from Block 15/06 is expected to reach a peak of 150,000 bpd this year.

Announcing the launch in February, Eni's chief executive Claudio Descalzi promised more to come: "Cabaça South East brings our number of fields [in Angola] in production to five, with two more expected to start before the end of 2018."

In a conference call in early

March 2017, Descalzi cited the Angolan operations as playing an integral role in projected output increases for 2017 along with projects in Ghana, Egypt, Indonesia and Kazakhstan.

### Activity in the upstream sector

There are plenty of other signs of upstream activity too. Total, one of Angola's other big hitters, may be nearing a final investment call on the Zinia field, a satellite of Pazflor, which was deferred following the oil price slump. At the same time, Sonangol is in talks with oil majors to deploy two new rigs that it commissioned from South Korea's Daewoo Shipbuilding and Marine Engineering in 2013, when oil prices were riding high. They are the first rigs to be owned by the state oil company.

### The emergence of gas

The Soyo LNG plant, run by Angola LNG in a Chevron-led venture, has finally gone into production after numerous delays, including a two-year shutdown which was put in place in 2014 to resolve design flaws.

Soyo's first cargo was loaded in June 2016 and was sold by an international tender.

There was another shutdown in December 2016 but production restarted in January 2017. The plant was taken offline around 22 December for a controlled shutdown, according to Reuters.

### Challenges for the national oil company

Sonangol hopes it can lease the rigs out to help boost the offshore exploration and production effort.

However, the state company faces more serious challenges too, including stiff opposition to the appointment of President Jose Eduardo dos Santos' billionaire daughter as its head. Isabel dos Santos was appointed Sonangol chief executive in 2016 by her father – who has been president since 1979 – and has said she wants to reform the company to improve transparency and efficiency. But that will be a stern test in a country where transparency has long been called into question.

US regulators are currently probing a deal in which BP and its partner Cobalt International Energy agreed to pay US\$350mn to fund a research centre, to be run by Sonangol, that has yet to materialise.

The *Financial Times* reported in December 2016 that Sonangol may hold tenders for all fuel imports in 2017 in order to cut costs. This move could potentially impact on Trafigura, a Swiss commodities trading company, which has been the biggest supplier of fuel to Angola for more than 10 years.

Another challenge Dos Santos faces will be pushing through local content initiatives, to ensure more oil and gas work is performed by Angolan enterprises, in order to boost jobs and skills, and ultimately encourage greater industrial diversification. ♦





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# KUDU RIDES AGAIN: GAS PROGRESS FOR NAMIBIA

Namibia is looking to make progress on its flagship Kudu gas project this year, encouraging the many smaller upstream investors who continue to believe in the south-west African country's offshore potential. Martin Clark reports.



*Gas from Namibia's Kudu project is expected to help meet the country's power generation needs.*

Image Credit: jbidane/Flickr

**THOUGH NOT KNOWN** as one of Africa's great oil and gas producers, Namibia has long enticed international investors, and for good reason.

In terms of location, the country sits just beneath Angola, one of Africa's top two oil exporters, alongside Nigeria, which continues to yield immense offshore riches, pulling in billions of dollars in foreign investment. This offshore search

has spread into Namibian waters, where most of the country's potential is believed to be located.

It is not just potential either, with oil and gas already identified, including the giant Kudu gas field, discovered way back in 1974. The offshore field sits approximately 170 km north-west of the city of Oranjemund, on the border with South Africa, and in around 170m of water. Reserve estimates vary hugely, with at least 1.3tn cubic feet of

confirmed natural gas, potentially running up to 9 trillion cubic feet, subject to further exploratory work.

Although commercialisation of this field has thus far eluded the industry, various development options through the years have included piping the gas to the shore to feed a large power plant - the current preferred option - a floating liquefied natural gas (FLNG) facility, and even running gas

across the border by pipeline to South Africa.

Earlier this year, BW Kudu Limited, a wholly owned subsidiary of BW Offshore, took a 56 per cent stake in the Kudu block, joining state oil firm, National Petroleum Corporation of Namibia (Namcor). It is the latest in a long line of investors and owners linked to Kudu, that include the likes of Shell, Chevron, and, more recently, Tullow Oil and Gazprom. This



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time, there is a belief that Kudu's potential can be unleashed, with the development of a gas-fired power plant onshore central to the development.

BW Offshore's chief executive, Carl K. Arnet, announcing the deal in February, said the new-look consortium aims to secure a final investment decision (FID) by the final quarter of 2017: "BW Offshore will now start the work with the Namibian government, Namcor, NamPower (the Namibian power utility), large infrastructure investors and other stakeholders to get this very exciting project to FID," he said.

Arnet said falling development costs after the 2014 drop in oil prices had helped to make the project more "economically feasible". The project, which will produce for 15-

Charity Oil & Gas has interests in Namibia's offshore Lüderitz basin.



Image Credit: Juddane/Flickr

25 years, will feed an 800MW power plant onshore that will "reshape electricity supply in south-western Africa, providing a secure long-term supply to support the development of

Namibia and potentially neighbouring countries," he added.

The revival of the Kudu project has sparked renewed enthusiasm among other upstream players too, which still include notable names such as Tullow Oil and Repsol, among others.

Unlike Angola, however, which is dominated by the world's biggest oil companies - Total, Eni, BP, Chevron - Namibia has been a hive of activity for smaller industry players looking to make a name for themselves. Here, the vital word is "potential", something Namibia holds in abundance. Junior oil explorers are hoping that the country can emulate the likes of Ghana, Liberia and Sierra Leone, in yielding high impact oil discoveries.

UK-listed Charity Oil & Gas was one of the first explorers to secure its licence areas offshore Namibia, with four blocks in the Lüderitz and Orange Basins. It believes that, in addition to the proven Kudu play, all elements required for a material oil accumulation have been demonstrated and are present offshore Namibia.

The company has compiled a huge data set from extensive seismic and drilling completed to date, with two prospects - Prospect B and AO - now deemed "drill ready". It is seeking

a partner to help with the drilling of these wells.

Other independents are likewise gearing up to test Namibia's offshore with the drill bit. Among them is Canadian firm Eco Atlantic Oil & Gas, which listed on London's AIM market this year. In Namibia, it holds interests in four offshore petroleum licenses covering more than 32,000 sq km in the Walvis and Lüderitz Basins, close to blocks controlled by Repsol and Tullow. It is looking to finalise drilling permits on the Cooper and Guy blocks, which it hopes will be in place by the third quarter of 2017, paving the way for a debut well.

Another independent working up to a first well is Lekoil, which is focused on the Namibian market, as well as Nigeria; here, it is close to reaching its "first oil" milestone at Nigeria's Otakikpo field.

In Namibia, the company, which is also listed in London, holds a 77.5 per cent gross interest in two blocks (2514A and 2514B) in the Lüderitz Basin, which have shown prior history of oil seeps. The company is reviewing historical seismic and well data with a view to commencing seismic acquisition shortly. With plenty of activity and no shortage of potential, it could be that Namibia's oil and gas era is about to begin. ♦

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Topic: Attaining Optimal Production and Profitability in the Development of Marginal Fields: Spotlight on Coning, Challenges and Best Practices for Hydrocarbon Management

**Professional's Workshop**  
(Monday, Jul 31, 2017 >> 1.00pm)  
Topic: Thriving in Boom and Bust Cycles: Strategies and Options for the Young

**Panel Session1**  
(Tuesday Aug 01, 2017 >> 10.00am)  
Topic: Transforming Africa's Petroleum Industry for Operational Excellence

**Women Development Programme**  
(Tuesday Aug. 01, 2017 >> 1.00pm)  
Topic: Women in Leadership: Aspire, Invest, Achieve

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By Dr. Mason Oghenigbo

4. Hole Problems and Unscheduled Events Management for Well Construction and Optimization  
By Professor Adewale Dosunmu

5. Well, Reservoir and Facility Management  
By Mr. Akande Adediji

6. Fundamentals of Reservoir Engineering  
By Mrs. Rita Okoroafor

7. Enhanced Oil Recovery Processes: Theoretical and Practical Approach  
By Prof. Olatunji, A. [Engr.]

# MAJOR LOGISTICS CHALLENGES FOR OIL AND GAS OPERATORS

In an environment where cost control is crucial, it makes economic sense for African operators to spend on adequate logistical solutions for more efficient operations, a streamlined supply chain and to attract much-needed investment.

**O**PPORTUNITIES FOR AFRICAN operators to capitalise during the oil price slump are being hampered by logistical solutions that are below par. Eliminating supply chain waste, better procurement strategies, and supply chain resilience are needed to improve performance in logistics. Investment in supply chain management can have the knock-on effect of attracting international investment.

Detlev Ducv, Dachser Intelligent Logistics South Africa's managing director, wrote that oil and gas revenue is spurring African countries to become leading destinations for international investors and this generates a strong potential market for transportation and logistics providers, including those in the oil and gas industry.

## Streamlined supply

Giorgio Bresciani and Marcel Brinkman of McKinsey & Company wrote that offshore fields in particular have seen costs rise significantly, which has led to high break-even levels.

Their report recommends sharing financial risks for future rewards. They cite the example of GE and Diamond Offshore signing a deal in which GE retains ownership of eight blow-out preventers and guarantee their performance via payments that are tied to the rig's activities



Offshore developments in Ghana, such as Cape Three Points, will boost the country's oil and gas logistics sector.

Image Credit: Eto/Flickr

and blow-out prevention performance. This means the capital expenditure is shifted up front with the service company, GE, taking on the greater burden.

## Investment in Africa

In May 2016, Total bought oil logistics terminals and gas stations in east Africa as part of a diversification strategy. It bought Gulf Africa Petroleum Corp's assets in Kenya, Tanzania and Uganda. The oil logistics terminals are located in the port cities of Mombasa in Kenya and Dar es Salaam in Tanzania.

LADOL, the Nigerian industrial free zone and offshore logistics hub located at Lagos Harbour, has Norway-based

Ocean Installer investing at the site. The Norman Vision is a purpose-built, new-generation subsea high-capacity construction vessel.

The vessel was hired by Folawiyo Aje Services and embarked on her maiden visit to Nigeria in January 2016 for the Aje field subsea installation project at OML 113 at Benin Basin of Western Nigeria, 24km offshore. The project was the first to be completed using 100 per cent indigenous Nigerian base support for a Nigerian client.

In South Africa, the oil and gas service facility at Saldanha Bay is slated for completion by 2018. The Port Saldanha project is intended to be South Africa's

first offshore supply base. Construction started in mid-2015. The project will be developed with the Saldanha Bay Industrial Development Zone, and has attracted global interest.

It is expected that the operation will start as a supply base with services such as storage, warehousing and material loading and offloading. However, the oil price slump may slow the pace of development.

In late 2016, a spokesman for the Transnet National Port Authority said that in regard to multiple projects, expectations of the authority need to be realigned with expectations of investors so solutions matched with risk can be devised. ♦



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# TECHNOLOGY FOR THE ERA OF BIG DATA

Leveraging big data for operational success has become par for the course in the oil and gas industry worldwide. Robust geophysical data management solutions are essential for this new era. Martin Clark reports.

**T**HE UPSTREAM EXPLORATION and production industry generates a lot of data. The amount of information held for a single drilling well, not to mention seismic data accumulated before - plus historical geophysical information - can be enormous.

More powerful computers make this data management possible, though not easy. While the industry has been handling big data for years, new options for the management of this unwieldy - but vital - commercial information are now available via cloud and multi tiered storage.

Given that data size and volumes are growing, this has been a major leap forward.

In the past, companies opted to store seismic data on tapes that were often difficult to maintain or even lost, due to the size and cost of disk space.

Accessibility is another important advance, with remote access improved via the internet.

This speeds usage of the data too, in much the same way as slimming down very large seismic files in order to make the data more manageable.

According to Halliburton, tiered and cloud storage offers new and cost effective ways of managing large seismic datasets, while web-based viewers and admin tools make it easier to find and manage data.



*Big data is now accessible wherever there is an internet connection, making remote access to information much easier.*

Image Credit: Shutterstock

Its own "Landmark" service provides a full seismic data management solution that leverages multi-tier data storage to maintain seismic data while minimising costs. It includes data and application integration, seismic storage and management,

as well as information management services.

Such tools will be necessary as the industry gears up for handling even more data, vital in the search for hydrocarbons and in reducing the risk of sinking high cost dry wells.

ExxonMobil said it achieved a "major breakthrough" with proprietary software using more than four times the previous number of processors used on oil and gas reservoir simulation models to improve exploration and production results. The US company is a leading player in many African upstream territories including Nigeria.

The breakthrough in parallel simulation used 716,800 processors, the equivalent of harnessing the power of 22,400

computers with 32 processors per computer, it said, enabling geoscientists and engineers to better predict uncertainties.

"We rely on this type of technology to model the complex processes that govern the flow of oil, water and gas in various reservoirs," said Exxon's Tom Schuessler.

Such processing power and technology requires huge data storage capabilities. Exxon worked closely with the US' National Center for Supercomputing Applications and its giant Blue Waters Super Computer. In theory, the technology and principles could be rolled out to Exxon reservoirs in Africa and worldwide, reaffirming the case for bigger and better data storage and management solutions. ♦

**“ This type of technology is relied upon to model the complex processes that govern the flow of oil, water and gas in reservoirs ”**





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# NUMBER-CRUNCHING THE DATA FOR ACCURATE FLOW MEASUREMENT

It is important to measure the meters when it comes to optimal oil flow measurement. When this is not done properly and metering systems are inadequate, operators stand to lose millions of dollars. Martin Clark reports.

**N**IGERIA MAY BE losing millions of dollars in wasted revenues every year because of inadequate metering systems recording incorrect crude production and liftings data. That was the message from Waziri Adio, head of the Nigeria Extractive Industries Transparency Initiative (NEITI) watchdog, who called for better metering infrastructure.

Flow measurement experts NEL are using Computational Fluid Dynamics (CFD) to model the performance of a vital piece of metering technology being designed and manufactured for Total's offshore Egina project, one of Nigeria's most ambitious ultra deepwater developments to date. Located 130km off the coast of Nigeria at depths of more than 1,500m, drilling began in December 2014 with 44 wells planned. These will be connected using umbilicals and risers to an FPSO designed to hold 2.3mn barrels of oil.

"The water depth poses a challenge for the development of Egina, which is one of the deepest offshore projects ever operated by Total," said Jean-Michel Guy, Egina's executive general manager.

The project was undertaken to check that the planned metering equipment would meet operational standards. One of NEL's core services is helping

companies to pick the right flow metering solution for individual projects.

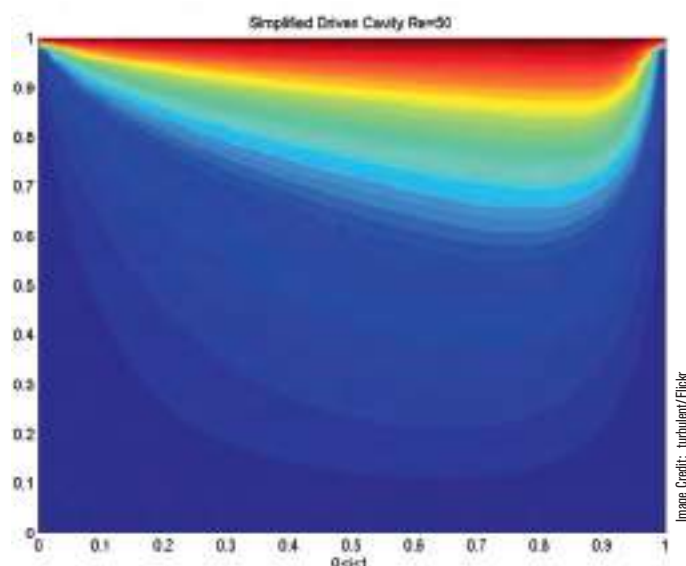
CFD is a branch of fluid mechanics that uses numerical analysis and data structures to solve and analyse problems that involve fluid flows.

And, it seems, Nigerian officials are taking the matter seriously too. Regulators from the country visited NEL's offices in the UK to discuss the CFD project. Marc Laing, CFD team manager, said the regulator visited NEL's East Kilbride headquarters to discuss project findings and to get briefed on the CFD approach.

"The regulator wanted to speak with our experts to get an understanding of the calculations that had been undertaken and how this would affect operations in Nigeria," he said.

The Egina project, which also includes CNOOC, Petrobras and

**“ Computational fluid dynamics uses numerical analysis and data structures to solve and analyse problems that involve fluid flows ”**



A computational fluid dynamics diagram.

Sapetro, is one of Nigeria's largest deepwater developments, with a peak production of 200,000 barrels of oil per day scheduled to come on stream in 2018.

It may contribute up to 10 per cent of Nigeria's total oil output by the end of next year, hence the significance of accurate metering.

"We ran analysis on the two system configurations proposed for the [Egina] project," said Laing, who added that the metering skid under assessment is to be located on a floating production storage and offloading (FPSO) vessel.

"We found that both design approaches would meet these requirements."

Egina's metering challenges illustrate the complexities facing oil companies and the quest for accurate flow measurement, especially on mega projects.

Trends that have driven metering technology include the rapid increase in automation and digitalisation, as well as a shift to more standardisation, modularisation, and industry cooperation.

In some ways, this is an inevitability as oil and gas projects become increasingly more complex, calling for such an integrated approach.

From drilling pad to refinery, reliable metering is integral to delivering successful projects. ♦



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# NEW OPTIONS FOR SATELLITE COMMUNICATIONS

Satellite technology is constantly evolving, and with every advance comes new benefits for oil and gas operators. Vaughan O'Grady looks at the latest developments and planned growth in the satellite communications sector.

**S**ATELLITES AND THE technology that uses them, on the ground, in the air, and at sea, are changing fast. For many oil rigs, the option is now not just Ku and C-band communications. Now there is the very promising Ka-band, a relatively plentiful and powerful source of bandwidth that is making inroads worldwide. However, sensitivity to extreme weather conditions means that it is not always ideal for offshore communications.

The distance satellites transmit from is changing too. A few geostationary satellites can cover the globe from around 36,000km above Earth. But a transmission round trip of many tens of thousands of kilometres brings frustrating delays during voice and data calls. The arrival of medium Earth orbit (MEO) and low Earth orbit (LEO) will change that.

LEO satellites, at an altitude of as little as 160 to 2,000km, do not come cheap – and you need a lot of them for good coverage. But that is what a number of initiatives are planning to offer.

OneWeb plans 648 LEO satellites, LeoSat Enterprises plans 108, and SpaceX plans thousands, all offering a variety of high speed communications services for everything from airline communications and disaster relief to consumer broadband.



*Oil and gas companies stand to benefit from investment in satellite communication technology.*

Image Credit: NASA's Marshall Space Flight Center/Flickr

These may still be in the future, but right now there is O3b, a MEO (about 8,000km from Earth) constellation, initially, 12 satellites. O3b is targeting energy among its customers, although the big winner so far is the Royal Caribbean Line cruise fleet, which is using the service for fast onboard internet access.

For the oil and gas industry, much of this innovation may prove too costly or require new equipment. However, operators can benefit from another revolution. High throughput satellites (HTS) are the much-discussed new breed of high-performance broadband satellites that often use Ka – but in some cases, Ku and C-band

frequencies – and will provide more bandwidth capacity delivering higher speeds at a lower cost.

An example is Inmarsat's upgrade to its global service, Global Xpress, which is now available through three Ka-band, high-speed and mobile broadband communications satellites.

Equally relevant to oil and gas is the transformation in ground equipment

infrastructure. The possibility of a teleport in the cloud, built-in interference mitigation, and ever-increasing processing power are the hallmarks of many modern satellite modems and VSAT systems. Add to that the mix new antenna technology and the development of flat panel versions, and the extent and speed of the product development cycles becomes immediately clear. ♦

**“ Oil and gas operators will benefit from high-throughput satellites, delivering more bandwidth and higher speeds at a lower cost”**



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# MAPPING THE FUTURE WITH 4D TECHNOLOGY

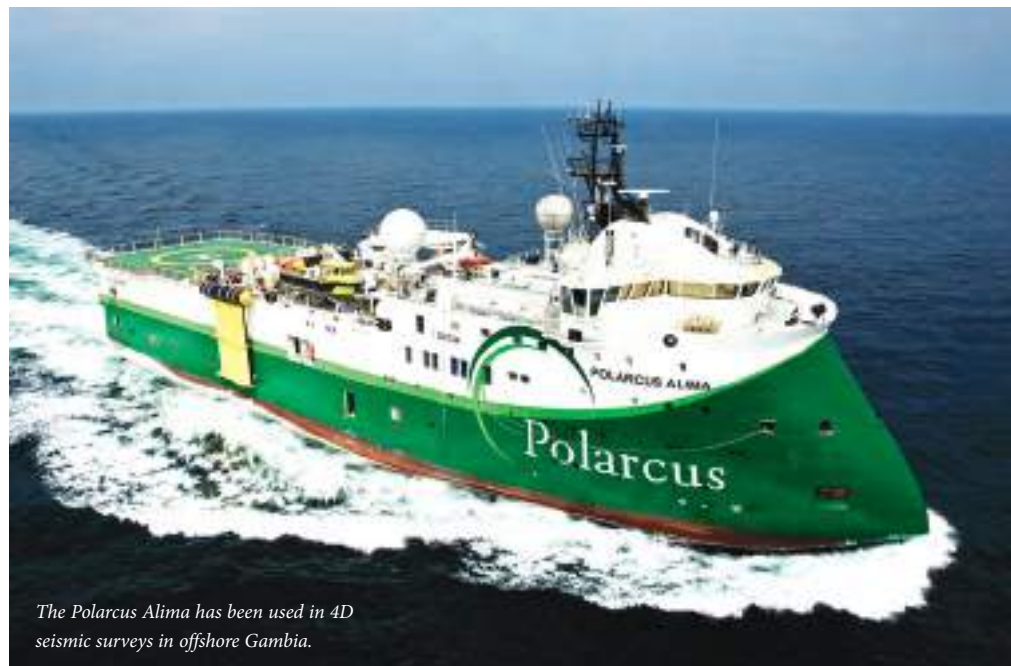
The emergence of 4D seismic technology is already proving to be a boon for operators seeking to explore offshore Africa for more oil and gas deposits. Martin Clark reports.

**S**EISMIC RESEARCH HAS moved on when it comes to mapping Africa's offshore oil and gas riches. The scale and size of seismic surveys have enlarged alongside the upsurge in computing power during the past 25 years or so, empowering oil companies with data options that were not available years ago.

Polarcus, a seismic contractor based in Dubai but listed in Oslo, is currently working on a 4D marine seismic acquisition project offshore West Africa, the latest effort to bring this state-of-the-art technology to the area. Utilising 4D seismic technology helps oil companies to determine changes to an oil or gas reservoir over time. The Polarcus project, announced in January this year, commenced in the second quarter of 2017, was originally due to run for approximately one month, but was later extended.

The company's past work in the area includes multi client surveys in Nigeria's deepwater and offshore Gambia.

While 2D and 3D seismic coverage has been extensive across West Africa's offshore, aiding explorers in the search for hydrocarbons, the use of 4D technology is more recent. The time-lapse seismic method involves acquisition, processing, and interpretation of repeated seismic surveys over a producing hydrocarbon field. 3D



*The Polarcus Alima has been used in 4D seismic surveys in offshore Gambia.*

Image Credit: Polarcus

technology considers oil and gas reserves as a cube along with its height, width, and depth, with no time element involved.

Leading technology providers in this field include industry giants like Schlumberger. It says the objective is to determine any changes occurring in a reservoir as a result of hydrocarbon production or injection of water or gas by comparing repeated datasets, hence the time-lapse acquisition of data. A typical final processing product is a time-lapse difference dataset, which should be close to zero, except where reservoir changes have been recorded.

The goal is to give operators an insight into how a reservoir is performing or changing, as a result of hydrocarbon production or water or gas injection. In a more challenging commercial environment, where lower oil prices are testing the economics of many offshore fields, this data can be critical. It is a trend that's set to grow, according to one recent industry report.

"The acceptance of the 4D seismic technique in the oil industry, both in production and exploration, is growing," the report states. The report, Global Offshore Oil and Gas Seismic Equipment and Acquisitions

Market 2016-2020, argues that the expenditure on exploration in deeper waters and the value of remaining oil in existing fields are just a few of the drivers shaping seismic technology development.

To illustrate the point, GNPC Operating Services Company Ltd (GOSCO), an independent Ghanaian upstream services firm, last year teamed up with seismic specialist CGG for a new joint venture dedicated to high-end marine seismic acquisition, including 4D. The new entity will focus on Ghana's territorial waters, an increasingly busy area of the upstream industry. ♦



# SPE CONFERENCE FOCUSES ON CHALLENGES AND OPPORTUNITIES

The Society of Petroleum Engineers will converge on Lagos in July for the Nigeria Annual Conference and Exhibition. A broad-ranging programme of speakers and workshops is planned for the delegates.

**T**HE THEME OF this year's Nigeria Annual Conference and Exhibition, "Riding the waves of boom and bust: Common objectives, diverse perspectives" seeks to cover the challenges and the opportunities that exist in Nigeria's oil and gas industry.

Low oil prices may have bottomed out but with lower prices becoming the norm for the foreseeable future, the challenge of keeping production costs competitive will remain for operators across Nigeria and beyond.

The conference's theme will address some of the main areas that contribute directly to production costs, from the perspectives of the government,

**“The speakers will cover issues such as the prevailing fiscal arrangements in Nigeria, streamlining contracts and security challenges”**

operators and service companies. The major issues that will be covered by the speakers, and in workshops and discussions include: prevailing fiscal arrangements in Nigeria; streamlining the contracting process especially for joint ventures; innovative solutions in project delivery and operations; talent management; security challenges; and regulatory policies, particularly with the Petroleum Industry Bill again

being a topic of much debate.

In a broad-ranging programme, delegates will not only be able to hear from leaders across the industry, but will also have the opportunity to attend a marginal field workshop, technical sessions encompassing more than 150 technical papers in 24 disciplines, two panel sessions, and programmes for the development of women and young professionals.

Additionally, short courses

and officers' workshops will be on offer to delegates.

The short courses will cover the following topics: well reservoir and facility management; enhanced oil recovery processes; petroleum resources volume and reserves evaluation and reporting; petroleum economics; strategic E&P leadership; hole problems and unscheduled events management for well construction and optimisation; and fundamentals of reservoir engineering. ♦

*The conference will be held in Lagos from 31 July - 2 August, 2017. For more information: <http://connect.spe.org/spenc/naice/naice2017>*

*Security for areas such as the oil-rich Niger Delta will be on the agenda at the conference.*

# UNMANNED SURFACE VEHICLES: HERE TO STAY FOR OFFSHORE

Robotics and underwater vehicles have been used in the oil and gas industry for decades. Without the use of autonomous underwater vehicles (AUVs) and remotely operated vehicles (ROVs) the industry would be far less efficient.

**I**N RECENT YEARS, unmanned surface vehicles (USVs) were introduced to the industry, helping lower cost and improve the efficiency of offshore operations. Liquid Robotics has been providing innovative solutions to address common challenges within the oil and gas industry. The Wave Glider USV, for example, provides a unique set of features offering new technical capabilities for service providers and operator, while lowering the costs and reducing risk.



Working offshore isn't for the faint of heart. Using wave

and solar power to propel itself, the Wave Glider is a long-

duration, alternative to expensive vessels or buoys. Risk and cost management drive offshore operational priorities. USVs enable innovative system architectures that offer new ways to lower risk and costs. Innovation can be a risk, but the oil and gas industry is always on the forefront of subsea unmanned technology. ♦

*This is an edited version of an article from Liquid Robotics, a Boeing company.*

## Customised solutions for African oil and gas operators

PROTEA CHEMICALS OIL & Gas business provides customised solutions to the oil and gas industries of Sub-

Saharan Africa, with special emphasis the West African and East African regions. These operations are supplied with

advanced value-added chemical products and services. Protea Chemicals supply the following to the African oil and gas industries:

synergies and efficiencies for cost reductions. A partnership-focused business strategy ensures customer expectations are met and exceeded.



Image Credit: Shutterstock

*Protea's solutions work across Africa's oil and gas industry, including offshore.*

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### Processing and Refining:

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Protea Chemicals Oil & Gas Unit leverages group-wide

### Additional value-added services

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- Technical assistance and support from suppliers
- Flexible supply options
- Application development support and assistance
- Supply chain
- Full service shipping team for inbound logistics
- In-house national warehousing & distribution systems
- Efficient local delivery solutions.



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The Forum in London will focus on up-to-date and emerging exploration plays and capital development projects, current corporate strategies in-place, insight into Africa's large and yet-to-find hydrocarbon reserves, the state-of-Africa's geo-economics of oil and the way forward, plus key issues shaping the future funding of companies and ventures in Africa's upstream.



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**79<sup>th</sup> PetroAfricanus Dinner** 24<sup>th</sup> May, with guest speaker: Jasper Peijs, Vice President for Exploration, Africa, BP, London

**8<sup>th</sup> Global Women Petroleum & Energy Luncheon** 25<sup>th</sup> May, with guest speaker: Sandy Stash, Group Vice President, Safety, Sustainability and External Affairs, Tullow Oil, London

## 24<sup>th</sup> - 25<sup>th</sup> May 2017

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# CAN DIGITAL OIL TECHNOLOGY HELP BALANCE HOPES WITH REALITIES?

The “lower for longer” oil price scenario can become a time of opportunity for oil and gas operators if smart technology is leveraged. Tommy Husvaeg explains how the digital revolution can make operations leaner and more efficient.

**A**T A TIME of unprecedented change in the upstream oil sector, digital technologies provide additional opportunities for oil companies to adapt to “lower for longer” oil prices. The conditions of the past 18 months have seen considerable headcount reductions in the upstream and substantial spending cuts. The current downturn, however, allows companies to leverage new ways of working that place technological innovation at the heart of leaner and more efficient operations.

Accenture's Tech Vision 2016 has three components – intelligent automation, platform economy, and digital trust – which are relevant to the digital conversation in today's oil and gas industry. Focusing on the first, intelligent automation, has at its core the shift to cognitive decision making, using technology not just as a tool to support the speed of decision making but also to execute decisions. The prevalence of robotics and deep learning (a branch of machine learning based on algorithms that attempt to model high-level abstractions in data) is also growing. When coupled with the internet of things (IoT), analytics and movement to the cloud, these technologies are becoming more accessible and insightful.

Despite a longtime focus on

*Digital technology is ideal for making efficiencies during the current low oil price scenario.*

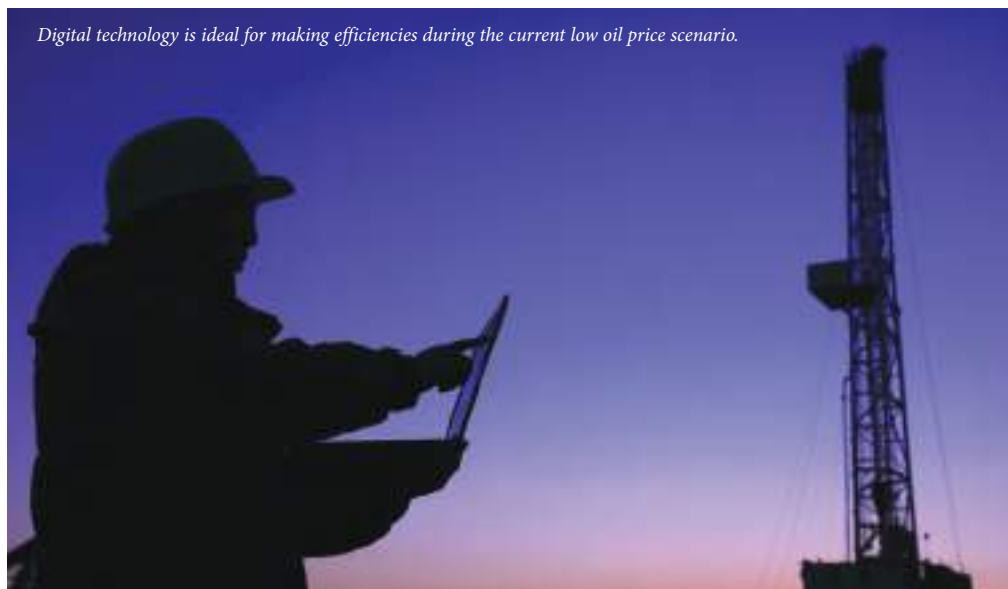


Image Credit: Shutterstock

engineering innovation, the oil and gas industry currently sits behind the curve in terms of digital innovation. Digital, however, is radically altering other commodity industries. For example, digital is already a

**“ The reality is that the digital agenda must enable efficiencies to reduce costs in the short term while maintaining safe operations”**

staple in mining, where companies routinely automate fleets and embrace real-time 3D imaging. The utilities industry is also enabling greater efficiencies by equipping workers with access to IoT data or wearables for quicker work execution.

To gain traction in the oil industry, however, the reality is a digital agenda must enable efficiencies to reduce cost in the short term while maintaining safe operations. This is especially true for companies with operations in high-cost areas.

There are multiple solutions to increase traction, with analytics solutions most immediately applicable. Connected production operations (CPO), for example,

can be cloud-based and deployed at low-cost. CPO can help in enabling management of field operations by exception and proactively minimise uncontrolled downtime, thereby boosting production at reduced cost. The North Sea sector is already benefitting, with one operator using CPO to help reduce the tripping of injection pumps through onshore monitoring and faster collaborative decision-making, thereby lessening production delays due to operational issues. ♦

*Tommy Husvaeg is a Principal Director at Accenture and is responsible for upstream subsurface, wells and production operations.*



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However, there is also an ever present need to utilize competent personnel equipped with both the skills and expertise necessary for handling such processes in order to keep working safely and achieving job tasks with greater to near perfect effectiveness and efficiency.

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Our training courses do not only help graduate trainees have a complete and comprehensive first time experience of the Oil and gas field operations, they also provide technical learning for accelerated career development, professional certifications, and post graduate degrees for experienced professionals—without interrupting career path and momentum.

### \*Our Courses

Our training courses include:

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*South Africa's Saldanha Bay is a leading location for the country's important oil and gas fabrication sector.*

# THE STATE OF THE AFRICAN MARKET: FABRICATION FOR OIL AND GAS

Image Credit: Shutterstock

South Africa continues to be a leading market for the oil and gas fabrication sector, with sites such as Saldanha Bay being home to multiple facilities which serve the wider African continent.

**F**ABRICATION IS AN essential part of construction and maintenance in the oil and gas industry. The US hydrocarbons boom of recent years has demonstrated how essential fabrication is, particularly during the construction of pipelines and equipment.

Whether new plays are being discovered or older plays are being brought back to their productive life, rapid construction is essential and

fabrication is at the core of these efforts. Increased activity places increased demands on existing infrastructure, as well as requiring the construction of new facilities – again, the role of fabrication cannot be understated.

For the African markets, providers of fabrication services are hoping for momentum to return to the continent's oil and gas industry after a sustained period of low oil prices. More big, lucrative projects would definitely be a boon to the

continent. Belmet, for example, won an important contract in Ghana's TEN reservoirs for Subsea 7 with the end clients being Tullow, Kosmos Energy, Anadarko Petroleum and the Ghana National Petroleum Company. The project consisted of six suction piles, 18 sleepers and 19 pipe walking piles, fabricated in the company's Ghana facilities, as well as 12 pipeline end terminations, four pipeline end manifolds and one subsea isolation valve fabricated in the Cape Town facilities and exported to Ghana.

According to the South African Oil and Gas Alliance, South Africa has a long track record of success in fabrication and construction projects with a skilled workforce and extensive training facilities at institutions and universities.

Private fabrication facilities are widespread in South Africa, including a major facility that opened in Saldanha Bay in 2007. This facility has been upgraded to focus specifically on large-scale upstream fabrication projects.

Not all fabrication facilities which will serve the African market are based on the continent. For example, a new maritime facility at Ras Al Khair in Saudi Arabia, will serve not only the Middle East but also East Africa, offshore India and the Eastern Mediterranean.

The planned Ras Al Khair facility, scheduled to come online in the mid 2020s, is expected to provide up to 16mn manhours of capacity, up from 8mn at operator McDermott's current Jebel Ali facilities. ♦

**“Increased oil and gas activity places increased demands on infrastructure and construction and the role of fabrication cannot be understated”**



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# AFRICAN RIG COUNT

COUNTRY	January 2016	February 2016	January 2017	February 2017
ALGERIA	51	52	51	50
ANGOLA	10	8	5	3
BENIN	0	0	0	0
CAMEROON	1	1	1	1
CHAD	0	0	0	0
CONGO (BRAZZAVILLE)	3	2	1	1
CONGO (DRC)	0	0	0	0
CÔTE D'IVOIRE	2	3	0	0
EGYPT	42	35	25	23
EQUATORIAL GUINEA	2	1	0	0
GABON	3	2	0	0
GHANA	1	1	1	0
KENYA	11	11	11	11
LIBERIA	0	0	0	0
LIBYA	1	1	1	1
MAURITANIA	0	0	0	0
MOZAMBIQUE	1	1	1	1
NAMIBIA	0	0	0	0
NIGERIA	9	6	6	7
SENEGAL	1	1	0	1
SIERRA LEONE	0	0	0	0
SOUTH AFRICA	1	1	0	0
TUNISIA	1	0	2	1
TANZANIA	1	0	2	1
UGANDA	0	0	0	0
<b>Grand Total</b>	<b>141</b>	<b>126</b>	<b>107</b>	<b>101</b>

## Online gauge reduces radioactive source size requirements



*This new gauge will help improve health and safety for operators.*

PLANT OPERATORS IN the oil and gas industry can reduce on-site radioactive source size requirements by using a nuclear gauge for the density, level and interface measurement of highly viscous process materials.

The Thermo Scientific InterfacePRO gauge can be

used for traditional gamma transmission applications (level and density measurements) or in gamma backscattering applications on large process vessels and pipelines. The gauge is designed to improve process control and lower operating costs by enabling quick

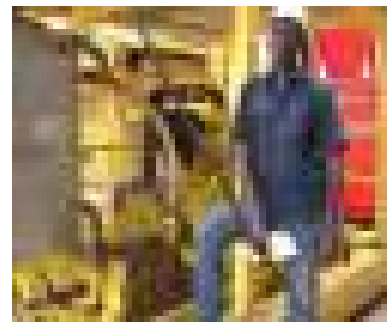
response to process changes or hazardous conditions. Additionally, the sensitive InterfacePRO gauge uses non-intrusive and durable gamma backscatter technology designed to minimise maintenance and lengthen instrument life.

“Employee safety and environmental health are priorities for industrial facility operators who are seeking innovative ways to optimise their plants,” said Lars Andersson, product line manager, level and density gauges, Thermo Fisher Scientific.



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## Infrared technology leveraged in portable, “fit and forget” four-gas monitor

HONEYWELL HAS INTRODUCED a gas monitor that uses infrared sensing technology in a user-friendly, portable format.

The BW Clip4 is a portable monitor that can detect four gases, offering simultaneous monitoring for H<sub>2</sub>S, CO, oxygen and combustibles.

It is a “fit and forget” monitor that, once turned on, can operate continuously for two years without the need to change sensors or charge batteries.

Additionally, it offers real-time display for instant gas readings, current gas concentration level readings, and changes in atmospheric conditions.

Using non-dispersive infrared technology, the BW Clip4 consumes 1,000 times less battery power than a traditional



Image Credit: Honeywell

*The BW Clip4 as seen in operation in the real world.*

catalytic bead sensor.

“The BW Clip4 operates on a fit and forget cycle—simply turn it on once and replace the detector two years later when the unit prompts you to do so,” said Ken Schmidt, vice president and general manager for Honeywell Industrial Safety. “It offers a

whole new combination of benefits in multi-gas detection that haven’t been possible until now: two years of battery runtime without re-charging or changing batteries, small size and ease-of-use, the functionality of a multi-gas detector, and improved safety compliance.”

## Mobile app launched to make it easier to order fire-protection system

FIRENUT, A POPULAR fire protection product from Trelleborg, can now be ordered via a mobile app.

FireNut has become a big seller for Trelleborg because it is a lightweight, easy-to-install alternative to bulky, fire-insulated metal boxes, which

are traditionally used to protect bolted connections and flanges on offshore installations.

It is a rubber-based fire protection system which specifically protects the nuts of a bolted

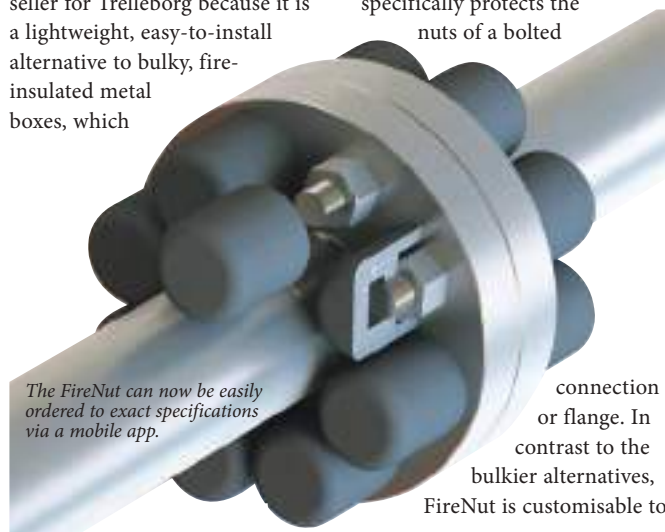


Image Credit: Trelleborg

*The FireNut can now be easily ordered to exact specifications via a mobile app.*

connection or flange. In contrast to the bulkier alternatives, FireNut is customisable to

accommodate almost any bolt size, as well as being easy to install. It is resistant to jet fire and pool fire.

The FireNut app is available for download to iPhones and iPads and there are plans for an Android release, as well as a web-tool.

“The app will give our customers a quick guide to choosing the best FireNut for their flange type,” said Patrick Waal, sales manager at Trelleborg’s offshore operation. “By installing effective and reliable passive fire protection systems like FireNut™, our customers can significantly improve onboard safety.”

To download, search “Trelleborg Firenut” in the app store.

## World-first cold repair on West African FPSO

COLDPAD HAS ANNOUNCED the completion of a successful campaign aimed at reinforcing hull brackets on an FPSO in offshore West Africa.

The repair offshore campaign was delivered safely within less than a week and no production disruption was incurred.

The cold work solution, Coldshield, used by COLDPAD delivered significant savings to the client in comparison with typical hot working techniques. Such techniques dramatically increased the risk of exposure to hazardous situations for offshore members of staff.

In contrast, cold work techniques on the hull and deck structures maximise production uptime and make it easier to plan and manage operations.

Coldshield, which was developed in partnership with Total and the Institut Français du Pétrole, is designed to permanently restore the initial structural capacity and durably protect damaged areas against further corrosion without resorting to hot welding methods.

Prefabricated pads are made to aerospace standards and then a two-step installation process is carried out.

A qualified surface preparation is performed prior to the vacuum-assisted injection of the structural polymer (epoxy resin).

The cold work schedule addressed multiple essential maintenance issues aboard the West African FPSO, including corrosion problems such as plate thinning, fatigue life-extension for the hull, deck, side shells, longitudinal and transverse frames, as well as crude oil tanks and sea water ballast tanks.



# Mantracourt launch intrinsically safe version of T24 system

## MANTRACOURT

ELECTRONICS HVES launched an intrinsically safe version of its established T24 wireless telemetry sensor system.

The new X24 range of products is ATEX and IECEx approved for zones one and two and was developed after feedback from existing users of the T24 system, many of whom wanted to extend this versatile system into hazardous areas. In the field, X24 has been found to be particularly suited to the petrochemical and industrial processing industries.

The new X24 range of products is ATEX and IECEx approved for Zones one and two and was developed after feedback



Image Credit: Mantracourt

Mantracourt launched its established T24 wireless telemetry sensor system.

from existing users of the T24 system, many of whom wanted to extend this versatile system into hazardous areas. In the field, X24 has been found to be particularly

suited to the petrochemical and industrial processing industries.

Alongside its ATEX / IECEx status, modularity is the main feature. The X24 system

comprises 3 products that are certified for use in hazardous areas - the X24-HD handheld display unit, X24-ACMI-SA cased transmitter and X24-SAE OEM transmitter. These new products currently operate with strain bridge inputs and gather and transmit data from force, weight, torque and pressure sensors. Being fully compatible with Mantracourt's T24 system, the data is transmitted to T24 receivers within the safe zone. This compatibility also means that the X24 system can be retrofitted, so companies can extend its existing T24 wireless network into hazardous areas, reducing installation costs and providing quick setup.

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# BUILDING A COMPANY TO IMPACT NIGERIA AND NIGERIANS

Folake Soyannwo, director of Prime Atlantic, talks to *Oil Review Africa* about the company's successes, coping with the low oil price scenario and meeting Nigerian local content requirements.

## How has Prime Atlantic (PAL) grown since 2005?

PAL has grown progressively by maintaining a focus on building capacity and excellence in service delivery without compromising safety and standards. We collaborate with international brands to provide services such as operations, maintenance, training and nationalisation, commissioning, safety training and consultancy, onboard tracking, data management, instrumentation, process automation, and risk management. We are a group of six incorporated joint venture entities with cumulative industry experience of over 220 years, employing over 570 people.

## What areas have been the most successful for PAL?

The most successful areas of our business have been those businesses involved in training and nationalisation. General maintenance services follow as a close second. These are the businesses directly related with capacity building, skills enhancement and Nigerian content development.

Our success is not measured by the bottom line but by the impact on Nigerians and Nigeria. We've trained over 300 graduates in multi-discipline technical training for roles previously occupied by expatriates. We've trained over 24,000 Nigerians in mandatory emergency response

management, in-country, eliminating the need to obtain certification outside the country. We provide Nigerians with certifications that allow them to export their knowledge and skills. We have an enviable track record on global maintenance, prioritising best in industry practice. This, for us, is what success looks like.

## Tell us about your vision to be sub-Saharan Africa's preferred services and solutions company in the oil and gas industry.

The vision has been carefully worded to reflect the long-term goals of the organisation. The oil and gas industry has been chosen as this is the largest sector in Nigeria's economy. Africa is a large continent with great prospects of being the biggest emerging market, however, in most African countries, the oil and gas sector has minimal links to other sectors of the economy, so the unemployment rate is quite high and this should not be.

Our services create linkages between various sectors. Some of the limitations are low levels of education and high levels of corruption in these countries.

We recognise the high cost of operations in these countries associated with the lack of infrastructure, security and instability. There are language and other perception barriers which could be overcome with trust built over time.



Folake Soyannwo, PAL director.

## What is the survival strategy in the low oil price scenario?

Our achievements have been properly managed with discipline, focus and long-term planning. This, thankfully, has given us a good foothold in spite of challenging times of declining oil revenues, volatile monetary conditions and FX shortages in Nigeria, compounded by the recent insurgency. We make adjustments to ensure service quality is not compromised. Companies should look inwards, re-strategise and be more creative in preparation for the upswing, which will certainly come as every industry goes through peaks and troughs. I fully expect things will pick up in 2017 and more significantly in 2018.

## How has training helped the Nigerian companies meet the local content requirements?

The Nigerian Content Act was passed in 2010 to ensure participation of Nigerian

companies in significant roles. Industry operations created employment opportunities but less so for Nigerians or Nigerian companies – there was a skills and competence gap. It became apparent that development of local capacity was a major requirement for the success of the act.

Our training areas are tailored to equip companies meet regulatory requirements by producing a pool of skilled Nigerians. The ability to recruit and train locally brings significant cost savings to any operation.

## How do the subsidiaries achieve PAL's mission and vision?

The nature of our subsidiaries is such that though our partnerships span across Europe and America, the philosophy remains the same – skills and competence, exceptional service, integrity and highest safety standards. Working together, we meet the mission and vision of becoming a one-stop hub for all services in oil and gas training, safety, maintenance and security.

## What about future plans?

We've been gearing up for the upturn, developing new competencies and forming new alliances to expand our services. We have our sights on offshore technical services that will utilise the manpower that we've played an active role in developing. ♦





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# CREATING value

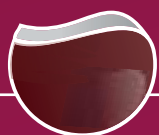
in energy trade and services  
across the continent...

- Equipment Leasing
- Engineering
- Construction

Upstream

Downstream

- Importation & Storage
- Supply & Trading
- Retailing



**Tulcan Energy**  
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